CLAIMS

What is claimed is:

1. An embedded three-dimensional inductor in a low temperature, co-fired ceramic (LTCC) substrate, the method comprising:

a tape layer with a cavity;

an inductor coil within the cavity, wherein the inductor coil comprises:

a first winding; and

at least part of a second winding spaced vertically apart from the first winding; and

a dielectric layer within the cavity between the first winding and the at least part of the second winding.

2. The embedded three-dimensional inductor, as recited in claim 1, wherein the at least part of the second winding is printed on the dielectric layer.

3. The embedded three-dimensional inductor, as recited in claim 2, wherein part of the at least part of the second winding is printed on part of the first winding to form an electrical connection between the first winding and the second winding.

4. The embedded three-dimensional inductor, as recited in claim 3, wherein the at least part of the second winding is a complete second winding and further comprising:

a third winding in the cavity vertically spaced from the second winding; and

a second dielectric layer within the cavity separating the second winding from the third winding, wherein the third winding is printed on the second dielectric layer and where at least part of the third winding is printed on at least part of the second winding to create an electrical connection between the first winding and the second winding.

5. The embedded three-dimensional inductor, as recited in claim 4, wherein the second dielectric layer comprises at least two separate dielectric sheets.

6. The embedded three-dimensional inductor, as recited in claim 5, further comprising a second tape layer, which covers the cavity.

7. The embedded three-dimensional inductor, as recited in claim 6, further comprising a via in the second tape layer, wherein the via is electrically connected to the first coil winding.

8. The embedded three-dimensional inductor, as recited in claim 7, wherein the second coil winding has a same shape and location as the first coil winding, being only displaced vertically with respect to the first coil winding.

9. The embedded three-dimensional inductor, as recited in claim 1, further comprising a second tape layer, which covers the cavity.

10. The embedded three-dimensional inductor, as recited in claim 9, further comprising a via in the second tape layer, wherein the via is electrically connected to the first coil winding.

11. A method of forming an embedded three-dimensional inductor, comprising:

forming a first coil winding;

placing a first dielectric layer on the first coil winding;

forming at least part of second coil winding on the first dielectric layer and part of the first coil winding to create an electrical contact between the first coil winding and the second coil winding; and

providing a first tape layer with a cavity, wherein the first coil winding, the first dielectric layer, and the second coil winding are within the cavity of the first tape layer.

12. The method, as recited in claim 11, wherein the forming of the second coil winding comprises printing the second coil winding on the first dielectric layer and part of the first coil winding.

13. The method, as recited in claim 12, further comprising a second tape layer, wherein the forming of the first coil winding comprises printing the first coil winding on the second tape layer.

14. The method, as recited in claim 13, wherein forming the at least part of the second coil winding comprises forming a complete second coil winding, and further comprising:

placing a second dielectric layer on the second coil winding; and

forming a third coil winding on the second dielectric layer.

15. The method, as recited in claim 14, further comprising firing the first tape layer, the second tape layer, the first, second, and third coil windings, and the first and second dielectric layers together.

16. The method, as recited in claim 15, further comprising the step of creating an electrical connection between the first coil winding and a via in the second tape layer.

17. The method, as recited in claim 16, wherein the placement of the second dielectric layer comprises:

placing a first dielectric sheet; and

placing a second dielectric sheet.

18. The method, as recited in claim 11, further comprising firing the first tape layer, the first and second coil windings, and the first dielectric layer together.

10005482.120601